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(71) Applicant *(for all designated States except DE, US)*: **KONINKLIJKE PHILIPS ELECTRONICS N.V.** [NL/NL]; Groenewoudseweg 1, NL-5621 BA Eindhoven (NL).

(71) Applicant *(for DE only)*: **PHILIPS INTELLECTUAL PROPERTY & STANDARDS GMBH** [DE/DE]; Steindamm 94, 20099 Hamburg (DE).

(72) Inventor; and

(75) Inventor/Applicant *(for US only)*: **HARDING, Geoffrey** [GB/DE]; c/o Prof. Holstlaan 6, NL-5656 AA Eindhoven (NL).

(74) Agent: **WOLFS, Marc, J., M.**; Philips Intellectual Property & Standards, Prof. Holstlaan 6, NL-5656 AA Eindhoven (NL).

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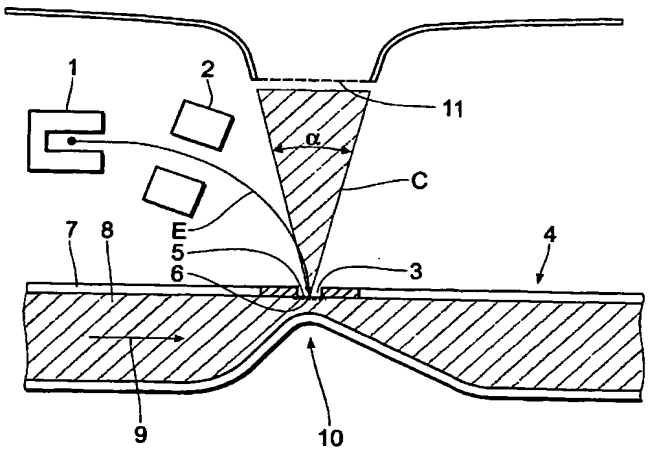
[Continued on next page]

(54) Title: X-RAY SOURCE FOR GENERATING MONOCHROMATIC X-RAYS



(57) Abstract: The present invention relates to an X-ray source comprising an electron source (1) for the emission of electrons (E), a target (4) for the emission of characteristic, substantially monochromatic X-rays (C) in response to the incidence of the electrons (E) and an outcoupling means (11) for outcoupling of the X-rays. To achieve characteristic, substantially monochromatic X-rays with a high power loadability electrons are incident on a metal foil (5) of a thickness of less than 10μm and a base arrangement (7, 12) is arranged wherein the metal of said metal foil (5) has a high atomic number allowing the generation of X-rays (C) and the material substantially included in the base arrangement (7, 12) has a low atomic number not allowing the generation of X-rays (C). The outcoupling means are adapted for outcoupling only X-rays (C) on the side of the metal foil (5) on which the electrons (E) are incident and which is opposite to the side of the base arrangement (7, 12) since on this side almost no bremsstrahlung radiation is generated.

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INTERNATIONAL SEARCH REPORT

Inte nal Application No
PCT/IB 03/05649

A. CLASSIFICATION OF SUBJECT MATTER
IPC 7 H01J35/08

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
IPC 7 H01J

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)
EPO-Internal, WPI Data, PAJ

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category °	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	EP 0 432 568 A (GEN ELECTRIC) 19 June 1991 (1991-06-19) abstract; figure 1 column 3, line 47 - column 4, line 35 column 5, line 19 - line 25	1,2,8,9, 12-14
Y		10,11
Y	DE 27 19 609 A (BAUER RICHARD DR) 9 November 1978 (1978-11-09) claims 1-3; figure 1 page 4, line 23 - line 35 page 5, line 21 - line 37	10,11
A	EP 0 584 871 A (TAN DAGANG DR) 2 March 1994 (1994-03-02) abstract; figure 2 page 3, line 5 - line 34	1,14

☐ Further documents are listed in the continuation of box C.

☒ Patent family members are listed in annex.

° Special categories of cited documents :

"A" document defining the general state of the art which is not considered to be of particular relevance

"E" earlier document but published on or after the international filing date

"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)

"O" document referring to an oral disclosure, use, exhibition or other means

"P" document published prior to the international filing date but later than the priority date claimed

"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.

"&" document member of the same patent family

Date of the actual completion of the international search	Date of mailing of the international search report
24 August 2004	08.11.2004

Name and mailing address of the ISA	Authorized officer
European Patent Office, P.B. 5818 Patentlaan 2 NL - 2280 HV Rijswijk Tel. (+31-70) 340-2040, Tx. 31 651 epo nl, Fax: (+31-70) 340-3016	Tano, V

INTERNATIONAL SEARCH REPORT

national application No.
PCT/IB 03/05649

Box I Observations where certain claims were found unsearchable (Continuation of item 1 of first sheet)

This International Search Report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons:

1. ☐ Claims Nos.:
because they relate to subject matter not required to be searched by this Authority, namely:

2. ☐ Claims Nos.:
because they relate to parts of the International Application that do not comply with the prescribed requirements to such an extent that no meaningful International Search can be carried out, specifically:

3. ☐ Claims Nos.:
because they are dependent claims and are not drafted in accordance with the second and third sentences of Rule 6.4(a).

Box II Observations where unity of invention is lacking (Continuation of item 2 of first sheet)

This International Searching Authority found multiple inventions in this international application, as follows:

see additional sheet

1. ☐ As all required additional search fees were timely paid by the applicant, this International Search Report covers all searchable claims.

2. ☐ As all searchable claims could be searched without effort justifying an additional fee, this Authority did not invite payment of any additional fee.

3. ☐ As only some of the required additional search fees were timely paid by the applicant, this International Search Report covers only those claims for which fees were paid, specifically claims Nos.:

4. ☒ No required additional search fees were timely paid by the applicant. Consequently, this International Search Report is restricted to the invention first mentioned in the claims; it is covered by claims Nos.:

1,2,8-14

Remark on Protest

☐ The additional search fees were accompanied by the applicant's protest.

☐ No protest accompanied the payment of additional search fees.

FURTHER INFORMATION CONTINUED FROM PCT/ISA/ 210

This International Searching Authority found multiple (groups of) inventions in this international application, as follows:

1. claims: 1,2,8-14

An x-ray source for generating monochromatic x-rays comprising a target having a metal foil of a high atomic number and of a thickness of less than 10 micrometers and a base arrangement having a material with a low atomic number and an outcoupling mean on the side of the metal foil on which the electrons are incident and which is opposite to the side of the base arrangement (claim 1) wherein:
said base arrangement comprises a rotatable base plate of a material having an atomic number of less than 10 (claim 2)

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2. claims: 3-7

An x-ray source for generating monochromatic x-rays comprising a target having a metal foil of a high atomic number and of a thickness of less than 10 micrometers and a base arrangement having a material with a low atomic number and an outcoupling mean on the side of the metal foil on which the electrons are incident and which is opposite to the side of the base arrangement wherein:
said base arrangement comprises a cooling circuit arranged to allow a coolant to flow along the side of said metal foil opposite to the side on which the electrons are incident (claim 3)

INTERNATIONAL SEARCH REPORT

Inte al Application No
PCT/IB 03/05649

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
EP 0432568 A	19-06-1991	EP 0432568 A2	19-06-1991
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DE 2719609 A	09-11-1978	DE 2719609 A1	09-11-1978
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